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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/785,458	02/20/2001	Susumu Hashimoto	016907/0935	9555

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FOLEY AND LARDNER
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WASHINGTON, DC 20007

EXAMINER

MILLER, BRIAN E

ART UNIT	PAPER NUMBER
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2652

DATE MAILED: 07/09/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/785,458

Applicant(s)

HASHIMOTO ET AL.

Examiner

Brian E. Miller

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 July 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 and 43-56 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-10 is/are allowed.
- 6) ☒ Claim(s) 43-56 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 11.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

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This is a Continuation of Reissue application 09/146,222 and claims 1-10, 43-56 are now pending.

Suspension of Action

Since the time period for the suspension of action filed under 37 CFR 1.103 has expired, an Office Action on the merits follows.

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 10/2/02 has been entered.

Reissue Applications

2. Applicant is reminded of the continuing obligation under 37 CFR 1.56 to timely apprise the Office of any litigation information, or other prior or concurrent proceeding, involving Patent No. 5,552,949, which is material to patentability of the claims under consideration in this reissue application. This obligation rests with each individual associated with the filing and prosecution of this application for reissue. See MPEP §§ 1404, 1442.01 and 1442.04.

3. The original patent, or an affidavit or declaration as to loss or inaccessibility of the original patent, must be received before this reissue application can be allowed. See 37 CFR 1.178.

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4. It is reminded that in accordance with 37 CFR 1.175(b)(1), a supplemental reissue oath/declaration under 37 CFR 1.175(b)(1) must be received before this reissue application can be allowed.

An example of acceptable language to be used in the supplemental oath/declaration is as follows:

"Every error in the patent which was corrected in the present reissue application, and is not covered by a prior oath/declaration submitted in this application, arose without any deceptive intention on the part of the applicant."

5. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim Rejections - 35 USC § 103

6. Claims 43-~~56~~ are rejected under 35 U.S.C. 103(a) as being unpatentable over Dieny et al (US 5,159,513) in view of Lin et al (US 5,315,468) and Liao et al (US 4,756,816).

With respect to claims 43 & 55 Dieny et al discloses in FIG. 2 a magnetic head including a magnetoresistance effect element including a spin valve having a first ferromagnetic layer 16; a second ferromagnetic layer 12; a nonmagnetic spacer layer 14 in between the two ferromagnetic layers; and an antiferromagnetic layer 18 provided adjacent to the first ferromagnetic layer; (as per claim 54) wherein the antiferromagnetic layer 18 is provided on the ferromagnetic layer (see FIG. 2); (as per claim 53) wherein the antiferromagnetic layer has a film thickness larger than that of the first ferromagnetic layer, i.e., 100 angstroms vs. 34 angstroms (see col. 3, line 43).

With respect to the material of the antiferromagnetic layer, Dieny et al discloses for example FeMn (col. 3, line 43), however does not expressly recite the antiferromagnetic layer

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being formed of PtMn. Lin et al, however, discloses a magnetoresistive sensor employing an antiferromagnetic layer formed of PtMn (or PdMn) for exchange biasing a ferromagnetic layer (col. 8, lines 5-12). It is suggested that such materials would be readily substituted for prior art FeMn films; (as per claims 44-47) the Mn atomic % is specified as being in the range of 33-60 (see col. 8, line 10); (as per claim 52) wherein the "NM" alloy would encompass a tetragonal crystalline structure (see col. 8, lines 33-35). Lin et al also teaches (col. 8, line 9) the use of PdMn as the antiferromagnetic layer. From these teachings, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have substituted the spin valve of Dieny et al with an antiferromagnetic layer formed of PtMn or PdMn as taught by Lin et al in lieu of FeMn (or NiMn) as taught by Dieny et al. The motivation would have been: substituting PtMn or PdMn for NiMn would have been realized by a skilled artisan, since PtMn and PdMn have Neel and blocking temperatures similar to NiMn and have improved corrosive resistance over NiMn (see col. 2, lines 13-36 and col. 8, lines 14-18).

With regard to claim 48 Lin et al further teaches (col. 8, lines 14-18) adding Pt to Ni-Mn films for improved corrosion characteristics. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have provided the spin valve of Dieny et al with an antiferromagnetic layer formed of NiMnPt as taught by Lin et al. The motivation would have been: improved corrosion characteristics would have provided longevity to the MR structure.

With regard to claims 49 and 50, Dieny et al in view of Lin et al is silent as to the claimed amounts of Pt and Ni. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have provided the claimed amounts of Pt and Ni through routine

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engineering optimization and experimentation, lacking any unobvious or unexpected results, as would have been realized by a skilled artisan.

With regard to claim 43 & 56 and the recitation of the first ferromagnetic layer “consists essentially of CoFe” or “consists of CoFe”, respectively, although Dieny et al suggests the ferromagnetic layer 16 is a Co or Co alloy (CoMoNb or NiFeCo), is silent as to the alloy being CoFe, however, Official Notice is taken that CoFe is a known ferromagnetic film (see US Patent to Liao et al 4,756,816) and it would have been obvious to one having ordinary skill in the art at the time the invention was made to have utilized CoFe as the ferromagnetic layer of Dieny et al. The motivation would have been: since CoFe has well known magnetic characteristics that would be favorable for use in a magnetoresistance effect element, i.e., a highly stabilized magnetic domain, and good permeability with near zero magnetostriction, utilizing such a film would have been readily substitutable and apparent to a skilled artisan. Further, it has been held to be within the knowledge of a skilled artisan to select a known material on the basis of its suitability for the intended use; see *In re Leshin*, 125 USPQ 416 (CCPA 1960).

Allowable Subject Matter

7. Claims 1-10 are allowable over the prior art of record.

Response to Amendment

8. Applicant's arguments filed 7/24/03 have been fully considered but they are not persuasive.

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A...Applicants' main assertion is that (with respect to claim 56) Dieny does not teach using a CoFe ferromagnetic layer in a SVMR element, such that the claimed ferromagnetic layer which "consists of CoFe" excludes the NiFeCo ferromagnetic layer of Dieny.

While the Examiner agrees that Dieny alone would not teach this new recitation, the disclosure of Liao et al would have in combination with Dieny. Liao et al specifically teaches that CoFe has advantageous magnetic properties that would be favorable for use in a magnetic head. Dieny discloses a magnetic head that includes an MR transducer. Surely, a skilled artisan would have the knowledge to take known materials with advantageous magnetic properties and use them in MR magnetic heads.

B...The argument with respect to claim 43 is not persuasive as discussed in a previous response.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US Patent to Mitsumoto et al (4,208,254) is cited to show an alloy of FeCo used in magnetic applications.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian E. Miller whose telephone number is (703) 308-2850. The examiner can normally be reached on M-TH 7:15am-4:45pm (and every other Friday).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hoa T. Nguyen can be reached on (703) 305-9687. The fax phone numbers for the

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organization where this application or proceeding is assigned are (703) 872-9306 for regular communications and (703) 872-9306 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-4750.

A handwritten signature in black ink, appearing to read "B. E. Miller", is positioned above the printed name.

Brian E. Miller
Primary Examiner
Art Unit 2652

bem
July 1, 2004